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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/724,791	12/01/2003	Michael B. Korzenski	020732-100.686	1912

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MOORE & VAN ALLEN PLLC
P.O. BOX 13706
Research Triangle Park, NC 27709

EXAMINER	
UMEZ ERONINI, LYNETTE T	
ART UNIT	PAPER NUMBER
1765	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/724,791	KORZENSKI ET AL.	
	Examiner	Art Unit	
	Lynette T. Umez-Eronini	1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 November 2006*.

2a)☒ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-7,9,11-14 and 39-43* is/are pending in the application.

4a) Of the above claim(s) *43* is/are withdrawn from consideration.

5)☒ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-7,9,11-14, 39, and 40-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *43* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12/1/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/8/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114 to reconsider Applicants' arguments in Amendment, filed 10/9/2006. Applicants' submission filed on 11/8/2006 has been entered.

Election/Restrictions

2. Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claims 1, 4-7, 9, 11-14, 41 and 42, drawn to an etching composition, classified in class 252, subclass 79.1.

II. Claim 43, drawn to a method of producing MEMS devices, classified in class 438, subclass 689.

The inventions are distinct, each from the other because of the following reasons:

3. Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of

using that product. See MPEP § 806.05(h). In the instant case the product as claimed can be used in a materially different process of using that product such as cleaning photoresist residues.

4. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

5. Because these inventions are independent or distinct for the reasons given above and there would be a serious burden on the examiner if restriction is not required because the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

6. Applicant provisionally elected with traverse, Group I, claims 1-16, which are drawn to an etching composition in response filed 6/15/2005.

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

8. Newly submitted claim 43 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: Unlike (currently amended) claims 1, 4-7, 9, 11-14, and new claims 41 and 42, which are directed to an etchant composition, (new claim 43) is directed to a method of producing MEMS devices. Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 43 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1, 4, 5, 7, 9, 14, 41, and 42 are rejected under 35 U.S.C. 102(e) as being anticipated by Sehgal (US 2004/0050406 A1).

Sehgal teaches a composition for removing photoresist and or resist residues from a semiconductor substrate. The composition includes supercritical CO_2 and co-solvents [0023], which includes alcohols [0029]. Various other ingredients may be

blended into the co-solvent mixture, which includes surfactants. Sehgal teaches the surfactant may be non-ionic [0060]. Sehgal further teaches an accelerator such as carboxylic acids such and solvents such as lower alcohols (methanol, ethanol) [0046]. Sehgal also teaches an aqueous fluoride such as ammonium bifluoride may be added to the co-solvent mixture [0048]. Since Sehgal's composition comprises the same chemical components as claimed by Applicants, then using Sehgal's composition in the same manner as claimed by Applicants would read on and inherent result in,

A sacrificial silicon-containing layer etching composition, comprising a supercritical fluid (SCF), at least one co-solvent, at least one etchant species, at least one non-ionic surfactant, wherein the etchant species comprises at least one bifluoride compound selected from the group consisting of ammonium bifluoride and tetraalkylammonium bifluoride R_4NHF_2 and optionally at least one surfactant, **in claim 1**;

wherein the sacrificial silicon-containing layer comprises a silicon-containing species selected from the group consisting of silicon oxide and silicon nitride, **in claim 7**; and

wherein the sacrificial silicon-containing layer consists essentially of silicon, **in claim 14**.

Sehgal also teaches,

wherein the SCF comprises a SCF species selected from the group consisting of carbon dioxide, oxygen, argon, krypton, xenon, and ammonia [0025], **in claim 2**;

wherein the SCF comprises carbon dioxide [0023], **in claim 3**;

wherein the co-solvent comprises at least one C_1-C_2 alcohol [0026 and 0046], **in claim 4**;

wherein the co-solvent comprises methanol [0026 and 0046], **in claim 5**;

wherein the etchant species comprises ammonium bifluoride [0048], **in claim 9**; and

wherein the SCF is selected from the group consisting of carbon dioxide, oxygen, argon, krypton, xenon, and ammonia [0025], **in claim 41**; and

wherein the SCF is carbon dioxide [0023], **in claim 42**.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

13. Claims 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US '406 A1).

As to claims 30 and 40, Sehgal teaches all of the limitations as in re claim 1.

Sehgal differs in failing to teach the composition "consisting essentially of" or "consisting of" Applicants' specifically claimed supercritical fluid, at least one co-solvent, and at least one bifluoride compound, as recited in the claims.

However, Sehgal illustrates the combination of a supercritical fluid and at least one co-solvent, and an aqueous fluoride, which includes ammonium bifluoride may be added to the co-solvent mixture [0048] or other ingredients in supercritical form may be used alone or in combination with each other or with superciritical CO_2 [0025]. Hence, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Sehgal by using any combination of components, including Applicants' specifically claimed composition because such components are known to effect the disclosed composition in processing semiconductor substrate since Applicants have failed to provide evidence as to what is actually excluded by "consisting essentially of."

14. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US '406 A1) as applied to claim 1 above, in view of Mullee (US 6,306,564 B1).

Sehgal differs in failing to teach wherein the co-solvent comprises isopropanol.

Mullee teaches a stripping chemical comprising: supercritical CO_2, and one or more chemicals such as ammonium bifluoride in removing resist, residue, or other

contaminants on a wafer (column 3, line 67 – column 4, line 39). Mullee also teaches other chemicals such as an organic solvent that includes for example, an alcohol, methanol, ethanol, or isopropanol, which may be used independently or added to remove organic contaminants from a wafer surface (column 4, lines 21-28).

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Sehgal's composition by employing alcohols as taught by Mullee for the purpose of removing organic contaminants from the wafer surface (Mullee, column 4, lines 21-24).

15. Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sehgal (US '406 A1) as applied to claim 1 above, and further in view of Wilkinson et al. (US 5,789,505).

Sehgal differs in failing to teach wherein the nonionic surfactant is selected from the group consisting of fluoroalkyl surfactants, polyethylene glycols, polypropylene glycols, polyethylene ethers, polypropylene glycol ethers, carboxylic acid salts, dodecylbenzenesulfonic acid, dodecylbenzenesulfonic salts, polyacrylate polymers, dinonylphenyl polyoxyethylene, silicone polymers, modified silicone polymers, acetylenic diols, modified acetylenic diols, alkylammonium salts, modified alkylammonium salts, and combinations comprising at least one of the foregoing, **in claim 11**; and

wherein the nonionic surfactant comprises a modified acetylenic diol, **in claim 12**.

Wilkinson teaches acetylenic alcohols and diols have been utilized as non-ionic surfactants in cleaning applications (column 3, lines 18-21) and are contemplated to have utility in environmentally friendly cleaning operations (column 4, line 30-32 and column 5, lines 44-46), Wilkinson also teaches 0.01 to 30 wt % acetylene diol in CO_2 (column 4, lines 61-63). Hence, one can conclude the balance of CO_2 ranges from 99.09 to 70 wt %.

It would have been obvious to one having ordinary skill in the art at the time of the claimed invention to modify Sehgal's composition by employing a surfactant as taught by Wilkinson for the purpose of using a material that in environmentally friendly.

Sehgal in view Wilkinson differ in failing to teach wherein the etching composition comprises about 75.0 wt % to about 99.5 wt % SCF, about 0.3 wt % to about 22.5 wt % co-solvent, about 0.01 wt % to about 5.0 wt % etchant species,, based on the total weight of the composition, **in claim 13**.

However, Sehgal in view Wilkinson illustrates the specific combination of a supercritical fluid, co-solvent, an etchant (bifluoride compound) species, and one surfactant in a composition is known. Hence, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select any proportion of wt % of components in the combined references of Sehgal and Wilkinson because the wt % is considered a result effective variable, which would have been optimized by routine experimentation for the purpose of obtaining the disclosed composition.

Response to Arguments

16. Applicant's arguments, see Remarks, filed 11/8/2006, with respect to the rejection(s) of claim(s) 1-7, 9, 11, 12, 14, 39, and 40 under 35 U.S.C. §112(2); claims 1-7, 9, 11-12, 14, and 39-40 under 35 U.S.C. §103(a) as being unpatentable over Vaartstra (US 6,149,828) in view of Mulled (US 6,306,564 B1); and claims 11-12, under 35 U.S.C. §103(a) over Vaartstra (US '828) in view of Mulled (US '564) and further in view of Wilkinson et al. (US 5,789,505) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Sehgal (US 2004/0050406 A1) over claims 1, 4, 5, 7, 9, 14; Sehgal (US '406 A1) and Mullee (US '564 B1) over claim 6; and Sehgal (US '406 A1) and Wilkinson. (US '505) over claims 11-13.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynette T. Umez-Eronini whose telephone number is 571-272-1470. The examiner is normally unavailable on the First Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit 1765

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December 24, 2006

GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700